



Fact Sheet

Continuous noise

HELCOM Indicators



Description

Continuous anthropogenic noise represents a significant pressure on the marine environment due to its constant presence and extensive spatial coverage over the entire water column in open sea areas. The noise from ships, when sailing at service speed, is caused primarily by their propulsion (engine noise and propeller cavitation), with secondary components being machinery and the movement of the hull through the water. Sound has the capacity to impact marine organisms in several ways; for low frequency continuous noise, the ability to mask acoustic communication and reception of other, biologically relevant sounds, is of particular importance, as is the disturbance of behaviour that high levels of noise may lead to.



What is already happening?

This first-time quantitative assessment of continuous underwater noise shows substantial contributions of ship noise to the Baltic Sea environment, with considerable variations in space (shipping lanes much more affected than elsewhere) and in time (ship noise being more wide-spread in winter than summer). This indicator was below the 20% spatial threshold for all assessment units for marine mammals, but exceeded the 20% spatial threshold for 9 out of 17 assessment units for masking of fish communication, although not for fish behavioural disturbance where it was below the threshold value. It is to be noted that the assessment itself comes with significant uncertainties, relating to the selection of input parameters (most notably the Levels of Onset of Biologically adverse Effects - LOBE levels) and the distribution of the indicator species.



What can be expected?

For the long-term reduction of continuous anthropogenic noise in marine ecosystems to be achieved, the implementation of international, regional and national commitments is key. To list a few: the envisaged revised Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life, the 2021 Baltic Sea Action Plan, and the HELCOM Regional Action Plan on Underwater Noise.



Other drivers

Climate change may affect the indicator by directly affecting the shipping activity and other activities. With warmer winter temperatures, the ice-covered season in the northern Baltic and Gulf of Finland becomes shorter, which may extend the open-water season, thereby extending the time when smaller ships and ships without sufficient ice classification can navigate these waters. This may lead to a redistribution of ships over the year and possibly also an increase in shipping.



Knowledge gaps

Knowledge about the Levels of Onset of Biologically adverse Effects (LOBE) for indicator species will be improved in coming years, as many research groups are working on this topic. In particular, fish are known to be sensitive to the water particle motions. Future assessments are likely to include effects of particle motion generated by the sources of continuous noise. The habitat sizes of indicator species and the following sizes of assessment subbasins need attention and broader discussions. Many wind parks will be constructed in the Baltic Sea in the near future, so there would be a need to take into account these installations in future modeling. Actual ship underwater noise model considers only commercial ships. However, fishing and leisure boats are known to contribute to the underwater noise in the coastal waters during some seasons and their contribution should be included as far as corresponding ship traffic data will be collected.



Policy relevance

In the HELCOM framework, the updated Baltic Sea Action Plan¹ contains a dedicated section on underwater noise including both ecological and managerial objectives which are to be achieved through the implementation of the HELCOM Regional Action Plan on Underwater Noise. At international level, the International Maritime Organization (IMO) added "Noise from commercial shipping and its adverse impact on marine life" as a high priority item to the work programme of its Marine Environment Protection Committee (MEPC). In 2014, the MEPC approved Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (IMO, 2014), which are being currently reviewed by the Sub-Committee on Ship Design and Construction which in its meeting (SDC 9), held beginning of 2023, may eventually consider the revision process concluded and forward it to MEPC 80 for approval.

¹ HELCOM (2021a) HELCOM Baltic Sea Action Plan – Update 2021. <https://helcom.fi/wp-content/uploads/2021/10/Baltic-Sea-Action-Plan-2021-update.pdf>